

## REMARKS

The Examiner has restricted the claims in this case into three Groups: Group I directed to membranes (claims 1-17); Group II (claims 18-27 and 33-36) directed to certain membrane reactors; and Group III (claims 28-32 and 37-40) directed to a method for partially oxidizing a reduced gas. Applicant elects prosecution of the claims of Group I with traverse.

Applicants have amended the claims in view of the restriction requirement to add claims 41-47. Claims 41-44 directed to membrane reactors and claims 45-47 directed to methods of separating ionic species using the reactor membrane of claim 41. These claims are added to emphasize the relationships between the membrane, membrane reactor and method claims of the invention. It is believed that all of claims 1-17 and claims 41-47, at least, should be considered to be directed to the same invention as the claims of Group I. Applicants note that the claims of Group II could be rewritten as dependent upon membrane reactor claim 41 and that the claims of Group III could be rewritten as dependent upon method claim 45. Applicants urge that one or both of the claims of Group II or Group III should be rejoined with the claims of Group I for examination. Further, the new claims are of similar scope to the broadest membrane claim with respect to the membrane element of the reactor.

In support of the restriction of the claims of Group I and II (the membrane and reactor claims), the examiner states that the product as claimed "could be used in a materially different apparatus" (emphasis added) such as one "comprising sequential reduction and oxidation zones in combination with means for transfer of the reactant gas." The undersigned respectfully requests further explanation of the proposed "materially different" membrane reactor. It is not clear from this description exactly what device configuration the Examiner intends. As emphasized in the language of new claim 41, the membrane transports an ionic species from a reagent zone of the reactor to a reaction zone of the reactor. The membrane separates the reagent zone from the reactant

zone. This is the minimal unit of a membrane reactor. A membrane reactor may contain multiple membranes in contact with a single reagent zone and a single reactant zone. A membrane reactor may contain a plurality of separate reagent zone/membrane/reactant zone units. Ionic species from the membrane may be transported to another compartment to react with another gas. All of these examples, however, contain the reactant zone/membrane/reagent zone unit and are not materially different. The undersigned notes that the reagent zone (called the oxidation zone in a specific embodiment ) and the reactant zone (called the reduction zone in a specific embodiment) are sequential and linked by the selective transport of ions through the membrane. It is unclear how the alleged alternative reactor is in fact materially different from the reactor as claimed in new claim 41 and in the claims of Group II.

In support of the restriction of claims of Groups II (apparatus) and III (method), the Examiner states that the reactor as claimed could be used to practice a materially different process such as "a catalytic process for water-gas shift or steam reformation." The new reactor claims and method claims emphasize that the basic process that occurs in the reactor is selective transport of an ionic species. The ionic species may be formed in the reagent zone before it is transported through the membrane, and the ionic species once it has been transported may be reacted in the reactant zone to generate products. However, ion transport links all processes to be accomplished by the membrane of the membrane reactor. Thus, while the processes that can be facilitated by the membrane reactor are different in that different products (e.g., ions or reaction products of ions) may be produced, the processes are related by the mediation of the selective transport of the ions.

In support of the restriction of claims of Group I and III, the Examiner states that the membrane as claimed could be used to practice a materially different process such as "a catalytic process for water-gas shift or steam reformation." Again Applicants emphasize that the basic process accomplished


by the use of the membrane is selective ion transport. The ionic species once it has been transported may be reacted in the reactant zone to generate products. However, ion transport links all processes to be accomplished by the membrane. Thus, while the processes that can be facilitated by the membrane are different in that different products (e.g., ions or reaction products of ions) may be produced, the processes are related by the mediation of the selective transport of the ions.

Applicants do not assert that the membrane, reactor and process claims of this invention are obvious variants. Applicants merely point out the significant structural and mechanistic relationships among the reactors and processes claimed and that the reactor and method claims are structurally and functionally linked through ion transport through the membranes claimed. In view of this significant relationship, the examination of all of Group I, II and III claims should not represent an undue burden on the Office

In view of the foregoing, Applicants respectfully request withdrawal of the restriction requirement.

This submission amends the claims to add 7 dependent claims. Excess claims fees of \$63.00 are believed to be due on this submission. A check in the amount of \$63.00 is submitted herewith. If the payment is incorrect, please charge any deficiency or credit any overpayment to deposit account 07-1969.

Respectfully submitted,

  
Sally A. Sullivan  
Reg. No. 32,064

Greenlee, Winner and Sullivan, P.C.  
5370 Manhattan Circle, Suite 201, Boulder, CO 80303  
Telephone: (303) 499-8080; Facsimile: (303) 499-8089  
Email: winner@greenwin.com  
Attorney docket no. 88-99  
SAS:lem:10/30/03